Before the Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	ET Docket No. 04-37
Notice of Proposed Rulemaking	)	
	)	
Broadband over Power Line Systems	)	

COMMENTS OF THE DISASTER EMERGENCY RESPONSE ASSOCIATION, INC. (DERA) ON THE COMMISSION'S NOTICE OF PROPOSED RULEMAKING REGARDING TECHNICAL REQUIREMENTS AND MEASUREMENT GUIDELINES FOR ACCESS BROADBAND OVER POWER LINE SYSTEMS

The Disaster Emergency Response Association, Inc. (DERA), a nonprofit disaster service, educational, and professional organization, respectfully submits comments below that relate to proposed Access Broadband over Power Line (BPL) regulation by way of modification to Part 15 of the Federal Communications Commission Rules and Regulations (47CFR15).

EXECUTIVE SUMMARY

DERA concludes that serious interference to and disruption of vital communications systems in several licensed services throughout North America will almost certainly result from Access BPL implementation as currently proposed. Our specific concerns are:

1. The United States risks a communications crisis of unprecedented proportions if the FCC permits deployment of Access BPL systems without reducing Part 15 permitted emission levels by several orders of magnitude and greatly strengthening interference protection requirements to safeguard licensed operations and the public.
2. Safety and security of the American public and that of border communities in Mexico and Canada, as well as tribal nations located within the U.S., require that the FCC restrict Access BPL systems deployment until substantial technical problems can be resolved, presuming such resolution is even possible, given the laws of physics. Without FCC action, extensive deployment of Access BPL systems will likely have a disproportionately adverse impact on

economically disadvantaged individuals and may seriously impair the ability of utility providers to restore critical services following disasters.

3. Finally, while the Commission's endorsement of universal broadband access is commendable, the Commission should be mindful that other technologies now available can provide universal access without the serious, adverse consequences inherent with high frequency (HF) based Access BPL systems.

IMMEDIATE FCC ACTION RECOMMENDED

DERA strongly recommends that the Federal Communications Commission immediately take action to terminate further HF-based Access BPL deployment pending comprehensive technical study by independent technical experts, and effective, fail-safe implementation of technical and systems management controls that positively assure that all licensed operations and the public receive protection from all forms of harmful BPL interference under all conditions of operation. If the FCC should fail in this duty, then it will be incumbent upon the Congress to exercise legislative authority to compel protective action in the public interest.

DISCUSSION OF KEY ISSUES

1. HARMFUL INTERFERENCE IS NOW BEING RADIATED FROM ACCESS BPL SYSTEMS.

In 2003, the Federal Communications Commission (FCC) asked: "Would the new high speed Access and In-House BPL equipment pose a higher risk of interference to licensed radio services than the traditional carrier current systems?" Based on all available technical data and field studies in the U.S. and United Kingdom, the answer to the FCC question remains unchanged: Yes: Proposed Access BPL systems not only pose a higher risk of harmful interference, such Access BPL systems have already been shown to actually cause harmful interference to licensed radio services and the public. It is not likely that any Access BPL system using High Frequency (HF) or Very High Frequency (VHF) signaling for data transmission can be operated in such a way as to completely avoid harmful interference to licensed services and the public. Access BPL systems using HF and VHF signaling, by their very nature, will

radiate Radio Frequency (RF) energy. This RF radiation can become harmful interference when signals from multiple BPL sources or their reflectors are combined, or when a licensed service or member of the public is located within a strong RF field of the BPL system or one of its components. Recent studies by the National Telecommunications and Information Administration (NTIA) have shown that harmful interference from Access BPL systems may radiate for miles where they have the potential to cause harmful effects even to aircraft communications and navigation systems at great distances[1]. Various frequency "notching" schemes proffered by BPL proponents do not take into account that virtually any HF frequency, at any hour of the day or night, may be in use by a licensed system or member of the public. Many uses (such as duplex communications, separate transmit and receive locations, and receive-only activities such as the public's lawful reception of HF broadcasts or galactic RF emission monitoring for radio astronomy, among many other uses) do not radiate signals which would trigger the automatic notching systems. Furthermore, the U.S. government alone has approximately 59,000 HF frequency authorizations, any or all of which must be protected. States, local government, foreign embassies, tribal governments and private industry have their own authorizations equally in need of protection within the primary Access BPL signal band which ranges from 1.7MHz to 80 MHz for most systems and extends up to 130 MHz for at least one proposed system.

2 DETRIMENTAL IMPACT ON DISASTER RECOVERY.

One of the greatest challenges faced by any public utility is the restoration of essential service following a major disaster, such as tornado, hurricane, earthquake, flood, winter storm, fire, or other event that has disrupted service and damaged utility infrastructure. Particularly with electric utilities, any complication which slows restoration brings continued human suffering, extended disruption of commerce, delayed community recovery and increased cost of property damage. The added complication of repairing Access BPL systems associated with power lines can do nothing to expedite repair of electric utility lines following a disaster. Resources being finite, the utility company will have to choose between a faster electricity-only restoration or a slower electricity plus BPL restoration. It is most likely that utility

[1] NTIA Report 04-413, *Potential Interference from Broadband over Power Line (BPL) Systems to Federal Government Radiocommunications at 1.7-80 MHz: Phase I Study, Volume I.* U.S. Department of Commerce, April 2004. (page 6-20).

restoration would be faster if electric power and broadband services were separate entities working on parallel on unrelated systems. At the very least, the added labor needed by an electric utility to restore both electric service and Access BPL services following a disaster will consume reserve resources that might otherwise be available for mutual aid to other neighboring electric utilities which have also experienced service disruption because of the disaster.

3. INEQUITABLE IMPACT ON THE ECONOMICALLY DISADVANTAGED.

Harmful interference from Access BPL systems will likely affect economically disadvantaged individuals and families to a greater degree than more affluent members of society. While many Americans are able to avail themselves of amenities such as cable TV, satellite TV, satellite radio, and other advanced communications and entertainment systems, a large segment of society cannot afford these luxuries and must depend on direct broadcast TV and radio for news, weather, public safety information, emergency warnings, education, cultural, entertainment and religious programming. Many of these people live in rural or suburban areas where TV reception is already very poor, and where in many cases only two or three channels can be received at all.

A. With Access BPL systems proposing to use frequencies up to 80 MHz, this means that fringe-area reception of TV channels 2, 3, 4, and 5 may be threatened. Similar impact may also be felt by urban dwellers, especially the poorer ones, many of whom depend on "rabbit ears" antennas for TV reception in apartment buildings.

B. Additionally, a large population gains knowledge and enjoyment from listening to shortwave broadcasts. Many of these shortwave listeners are disabled or economically disadvantaged and their access to HF broadcasts is a very important part of their lives, even though they may rely on inexpensive receivers and simple indoor antennas. Access BPL systems will almost certainly cause harmful interference to this population, the members of which would not be likely to take advantage of broadband services due to the cost and whose non-cable TV reception may now also be impaired by interference from Access BPL systems.

C. The potentially adverse impacts on small business and on independent telecommunications operations of tribal nations were documented in responses to ET 04-37. The

telecommunications authority of the Cheyenne River Sioux Tribe objected to deployment of Access BPL on technical and economic grounds, while the nonprofit organization Small Business in Telecommunications objected to deployment of Access BPL because of the likely adverse impact on licensed telecommunications services. Both parties asked that the FCC proceed carefully and cautiously. In this regard, DERA would counsel the FCC to follow the advice of these entities and to pay particular attention to the need for government-to-government negotiations with Tribal Nations before allowing deployment of BPL systems that affect reservations, tribal lands or tribal business operations.[2]

D. The situation would be further exacerbated if Access BPL systems were permitted to extend their frequency range up to 130 MHz as proposed by at least one proponent.

4. BETTER BROADBAND SOLUTIONS CURRENTLY EXIST.

Currently, there are numerous broadband systems now available which can provide equal or better access than HF-based Access BPL without the harmful side-effects. Several additional solutions are in final development. For the FCC not to give these viable...and currently operational, reliable, and expanding... systems the opportunity of being universally deployed before confusing the marketplace with a flawed and problematic competing system is a very serious policy mistake.

A. Numerous wireless solutions such as systems based on IEEE Standards 802.11/a/b/g (some of which are known to the public as WiFi) and new high speed universal access point services are poised to deploy rapidly throughout the country; direct satellite data service is now available to virtually anyone in the country, although the cost is slightly higher than for most local access services; various wire-based solutions exist, such as ISDN, DSL, and cable modems. Not one of these existing systems causes harmful interference to licensed services and the public to the degree that HF-based Access BPL does.

B. Even if Access BPL theoretically can be installed to the "last house in the last mile," there are indications that the people for whom this service is being advocated (i.e. those at the end of rural power lines) will never see service since the requirement for a vast number of BPL repeaters will

[2] FCC ECFS Public Comments, ET Docket No. 03-104.

make this a prohibitively expensive proposition. Several of the less problematic systems could already be providing redundant rural coverage if those systems were to receive the financial support and policy-level backing which Access BPL now seems to enjoy.

5. OVERWHELMING OPPOSITION TO BPL SYSTEMS FROM UNBIASED TECHNICAL EXPERTS

In response to the FCC's Notice of Inquiry regarding BPL systems in 2003 (ET Docket No. 03-104), well over 5,000 public comments were filed with the FCC. Virtually without exception, the only technical comments filed in favor of BPL appear to be on behalf of those having a direct financial interest in the approval and deployment of BPL systems. Conversely, the strongest technical criticisms of BPL systems came from electronics and telecommunications experts with no financial interest in the outcome of the matter. The public's general comments were overwhelmingly against premature approval of BPL until further technical study could be accomplished. DERA strongly recommends that the FCC heed the stated wishes of the public and the strong recommendations of impartial experts in this matter.

6. ADVERSE IMPACT ON CRITICAL COMMUNICATIONS SYSTEMS.

Certain critical communications systems operating in licensed services are vital to public safety and welfare and due to their very nature must be protected from all sources of interference to the maximum extent feasible, both in terms of technology and regulation. DERA believes that degraded reception of aviation and maritime safety and distress signals will be likely to occur as a result of Access BPL system operation as proposed.

A. AVIATION SAFETY. One paramount example is licensed stations using the Aviation Distress Calling Frequency, an Amplitude Modulated (AM) channel at 121.5 Megahertz (MHz). There are also numerous HF and VHF frequencies allocated for air traffic control, enroute position reporting, weather advisories and aeronautical distress communications. Authorized uses of the VHF aviation distress channel include Emergency Locator Transmitters (ELT), Emergency Position Indicating Radio Beacons (EPIRB) and Personal Locator Beacons (PLB). Additionally, FAA TSO C91A standard provides that signals from these beacons must be suitable for intercept by orbiting

Cospas-Sarsat search and rescue satellite systems. Crashed aircraft whose beacons are activated on this frequency and individuals in distress operating handheld survival radios are often in desperate, life-threatening situations. Survivors are often situated in the worst possible locations for transmitting radio signals. Injured persons often must make radio calls with debilitated speech and physical restrictions which degrade their ability to efficiently operate radios. Furthermore, the possibility of successful rescue depends in large part on radio batteries which get weaker every minute they are used. Survival radios can be damaged by the crash impact; antennas can be broken off or bent, and batteries damaged. Under these adverse conditions, even the slightest increase in ambient RF noise level can make the difference between a distress signal being heard or not being heard by those in a position to help. An unheard signal--even for a few minutes--can make the difference between life and death for survivors. The laws of physics dictate that BPL, carried as High Frequency electromagnetic signals over unshielded, unbalanced open power lines, will be radiated as RF energy, increasing ambient noise levels, not just in the vicinity of power lines, but for great distances. Unintended RF radiation from such BPL systems cannot be a matter for policy speculation or wishful thinking. Signals under these conditions will radiate from power lines. RF noise levels will increase. Already, licensed communications systems are adversely affected by RF noise radiated from poorly maintained power distribution lines. Any second and third harmonics of BPL signals will inevitably increase background noise (even when they do not actually produce intelligible signals) on 121.5 MHz as well as other critical aeronautical communications and navigation channels throughout the HF and VHF radio bands. Maintaining the lowest practical RF noise level on aeronautical calling and distress frequencies is of paramount importance and is a basic moral and legal obligation of the FCC. Furthermore, direct interference to aircraft communications and navigations systems is a risk when Access BPL systems are in operation, according to the NTIA study, Volume 1. "Results showed that aggregate interference levels to the aircraft could exceed average ambient RF noise

levels at two frequencies (15 MHz and 25 MHz), at distances ranging from thirty-three kilometers (six kilometers altitude) to over fifty kilometers (altitudes between six and twelve kilometers."[3]

B. MARITIME SAFETY. Maritime safety is dependent on numerous HF and VHF channels for distress communications. While the ship in distress might be many miles away from BPL systems and unaware of BPL interference, the shore-based stations listening for and responding to distress calls will likely be affected by BPL interference. Just as with aviation distress signals, even the slightest increase in the RF noise floor will interfere with the ability to detect weak distress signals. HF Maritime calling and distress frequencies include 2182 KHz, 4125 KHz, 6215 KHz, 8291 KHz, 12,290 KHz, 16,420 KHz plus at least one VHF FM channel. All the HF maritime distress frequencies are in the fundamental frequency range of proposed BPL systems, making them especially vulnerable to direct interference from BPL. Quoting from the Acting Associate Administrator, Office of Spectrum Management, National Telecommunications Information Administration, Mr. William T. Hatch: "The HF bands allocated for the distress and safety communications of the maritime and aeronautical mobile (R) services have been subjected to harmful interference caused by unauthorized use. This unauthorized use of safety related HF frequencies has increased in recent years and is resulting in considerable worldwide interference to the operational distress and safety communications spectrum utilized by the maritime and aeronautical communities. Radio is the sole means of communications for the aeronautical and maritime mobile services and the frequencies in the bands allocated to these services are reserved or used for distress and safety purposes and that the aeronautical mobile (R) service is a safety service. **It is essential for the safety of life and property that distress and safety channels of the maritime mobile service and the allocations to the**

[3] NTIA Report 04-413, *Potential Interference from Broadband over Power Line (BPL) Systems to Federal Government Radiocommunications at 1.7-80 MHz: Phase I Study, Volume I.* U.S. Department of Commerce, April 2004. (page 6-24).

aeronautical mobile (R) service be kept free from harmful interference."[4]

(Emphasis added.)

7. ADVERSE IMPACT ON NATIONAL SECURITY COMMUNICATIONS

Local, state, tribal and federal government agencies are critically dependent on High Frequency (HF) and Very High Frequency (VHF) radio systems throughout the U.S. and within and among our North American neighbors during periods of emergency. Many of these licensed systems are not well known because of security concerns and their highly specialized functions.

A. It is understandable that BPL proponents may not have taken harmful interference to these systems into consideration in their earlier comments. Some systems are licensed by the FCC, while others are controlled by NTIA.

B. Many of these systems, due to their nature, have little or no visibility with the public or the commercial telecommunications industry, but the FCC, NTIA, and other controlling agencies have clear responsibility for protecting these allocated frequencies in the public interest. Most of these systems operate intermittently on irregular schedules driven by emergency situations, and by their very design do not draw attention to themselves. Nevertheless, these systems are absolutely vital to public safety and welfare, and particularly so in periods of natural disaster, transportation or industrial mishaps, or national security crisis.

C. The lives and welfare of thousands...if not millions ...of citizens depend on the immediate availability of these high frequency (HF) radio systems when needed, where needed, operating on authorized frequencies that are clear of harmful interference.

D. Comments filed with the FCC by the Chief Information Officer of the Federal Emergency Management Agency (FEMA) on 4 December 2003 are among the most important submitted thus far on this matter of telecommunications policy. The FEMA National Radio System (FNARS) and other critical systems detailed in that FEMA comment must be protected from interference as a matter of compelling national security and public safety without compromise. **DERA endorses**

[4] Letter of transmittal and enclosures dated 29 February 1999 informing the FCC of the position of Executive Branch agencies of the United States Government regarding WRC-2000 Agenda Item 1.7, Use of HF Bands by Aeronautical Mobile (R) and Maritime Services for essential communications. Document archive location: http://www.ntia.doc.gov/osmhome/wrc99pre/00271_fcc.pdf

and supports entirely the technical comments submitted by FEMA on 4 December 2003, which state that BPL systems as proposed will result in unacceptable interference to critical emergency communications systems. [5] DERA believes that the 4 December 2003 document represents a true and accurate technical assessment of the impact BPL will have on critical national security communications despite subsequent *ex parte* communications from a senior DHS official to the Chairman of the FCC.[6]

8. ADVERSE IMPACT ON DISASTER COMMUNICATIONS

DERA is typical of many organizations which respond in time of disaster. We need communications and we need lots of it. We often need it where it didn't exist before, and we may need more than was ever available before in that area. We depend upon a variety of wireless systems in numerous licensed services for support in time of disaster. We applaud every research initiative into new technologies which have the potential of improving and expanding communications, particularly high-speed data circuits. DERA has no "bone to pick" with BPL proponents and we sincerely appreciate the work done by BPL researchers to explore expansion of broadband availability. That said and despite our own desire for access to expanded broadband service, however, DERA cannot advocate for the deployment of any technology which, by its very nature, will degrade and interfere with other communications systems.

A. At this time, it appears that there is no known method by which BPL carried as High Frequency signals over unshielded, unbalanced open power lines can be prevented from radiating RF energy that will interfere with licensed services already providing essential telecommunications.

B. Projection of the effects of ubiquitous, relatively powerful BPL systems based upon past interference experience from a small number of geographically separated, ultra-low-power carrier current systems is not a technical model suitable to the present issue.

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[5] "Comments of the Federal Emergency Management Agency on Broadband over Power Lines Implementation." Public comment filed by the Chief Information Officer of FEMA with the FCC on 4 December 2003 in response to ET Docket No. 03-104.

[6] In an *ex parte* letter to the Chairman of the FCC from the Under Secretary for Emergency Preparedness and Response of the Department of Homeland Security on 8 January 2004, the official FEMA position regarding ET Docket No. 03-104 was restated as: "FEMA is supportive of our national goals of extensively deployed broadband facilities and of a more robust electrical utility infrastructure. FEMA appreciates that BPL could be a major factor in achieving these objectives." Filed as a Letter/Notice on 23 March 2004, FCC ECFS, ET Docket No. 04-37.

C. If Access BPL systems become operational as proposed, there will likely be severe interference to and disruption of radio systems critical to public safety and welfare throughout North America.

9. CONCLUSIONS

A. The RF issues related to BPL are highly technical, exceedingly complex, and in some cases they are not well-understood. The detrimental impact of BPL on licensed services is only now being fully realized, and may not be adequately defined until completion of the NTIA Phase II interference impact study and other research efforts now underway.

B. DERA, among many others directly affected by the BPL proposal anticipated that the FCC would dismiss existing BPL system proposals outright because of the inherent incompatibility of HF-based Access BPL systems with licensed communications services.

C. The recent course of events, including public comments by senior government officials praising the merits of Access BPL without acknowledging the serious and apparently insurmountable problems of BPL, indicates the possibility that some public policy makers may not fully understand and appreciate the grave risk to public safety and welfare that BPL poses.

D. All impacted parties need more time for detailed technical study of the signals radiated by Access BPL systems and more time to document and analyze the harmful interference that BPL systems cause. It is not in the public interest for the FCC to approve deployment of BPL systems until these assessments by impacted parties and technical evaluations by disinterested third parties can be completed and submitted for public comment.

10. RECOMMENDATIONS

A. DERA respectfully advises the FCC against any form of "Fast Track" approval of Access BPL systems and formally requests that the FCC allow for an extended period of full and open discussion, comprehensive research, peer-reviewed scientific analysis, and thorough technical assessment prior to making any decisions regarding Access BPL. DERA specifically recommends that the present Comment Period be extended by 90 days, with the Reply Comment period being similarly extended.

B. DERA strongly suggests that the FCC take no further action regarding the approval of Access BPL systems, nor make any changes in Part 15 requirements to accommodate BPL systems, until Part II of the BPL Interference studies have been completed by NTIA, then reviewed and commented upon by interested parties and the public..

C. Pending publication, technical review and public comment on both Volumes I and II of the NTIA BPL interference studies, DERA strongly recommends that the FCC impose a freeze on all further Access BPL system deployments or activations, and that any BPL system found to be causing harmful interference to any licensed service or the public be immediately ordered to cease operations.

Respectfully Submitted, 2 May 2004

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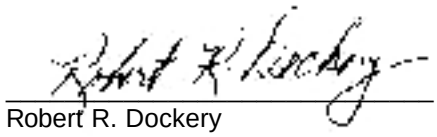
Approved for Submission, 2 May 2004



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